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10/010,506	11/13/2001	Brian T. Rosenberger	8571:88	6463

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EXAMINER
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AMARI, ALESSANDRO V

ART UNIT	PAPER NUMBER
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2872

DATE MAILED: 12/06/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/010,506

Applicant(s)

ROSENBERGER ET AL.

Examiner

Alessandro V. Amari

Art Unit

2872

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 December 2003.
- 2a) ☒ This action is FINAL. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1,3 and 7-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1,3 and 7-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)             | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)    | Paper No(s)/Mail Date. _____  |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date _____   | 6) <input type="checkbox"/> Other: _____                                    |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 102***

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1, 3, 10, 11 and 13-16 are rejected under 35 U.S.C. 102(b) as being anticipated by Deutsch et al US 4,340,617.

In regard to claim 1, Deutsch et al discloses (see Figure 1) an apparatus for forming a three-dimensional structure from a gaseous medium, comprising a processing chamber (14) to contain the gaseous medium (18); and a holographic projector to project at least one hologram into the gaseous medium within the processing chamber as described in column 11, lines 31-40, wherein the hologram imparts energy to dissociate gas precursors within the gaseous medium causing dissociated gas precursors to deposit in a pattern corresponding to the at least one hologram as described in column 4, lines 55-68 and column 5, lines 1-34.

Regarding claim 3, Deutsch et al discloses that the gas precursors within the medium are gaseous organometallic compounds as described in column 5, lines 10-14.

Regarding claim 10, Deutsch et al discloses that the energy to dissociate gas precursors corresponds to a wavelength of electromagnetic energy used to project the at least one hologram as described in column 5, lines 5-24.

Regarding claim 11, Deutsch et al discloses that the energy to dissociate gas precursors corresponds to absorption bands of the gas precursors as described in column 5, lines 5-10.

Regarding claim 13, Deutsch et al discloses wherein an intensity of the at least one hologram is manipulated to manipulate a deposition rate of the dissociated gas precursors as described in column 5, lines 21-29.

Regarding claim 14, Deutsch et al discloses that the gaseous organometallic compounds allow metal to be deposited in the pattern corresponding to the at least one hologram as described in column 5, lines 5-20.

Regarding claim 15, Deutsch et al discloses (see Figure 1) that the at least one hologram is projected onto a stage (16) within the processing chamber.

Regarding claim 16, Deutsch et al discloses (see Fig. 3) that the stage is thermally biased as described in column 10, lines 50-54.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Deutsch et al US 4,340,617 in view of Marcus US 5,017,317.

In regard to claim 7, Deutsch et al teaches (see Figure 1) an apparatus to deposit a three-dimensional structure comprising a holographic projector to project a series of

holograms as described in column 11, lines 31-40, a gaseous delivery system (19) to deliver gas precursors; and a processing chamber (14) wherein the processing chamber further comprises a window (19a) wherein the window is transparent to the holograms as described in column 5, lines 38-39, a plane (16) on which the holograms are imaged; an inlet (see opening in chamber 14 from tube connected to gaseous delivery system 19) to receive the gas precursors from the gaseous delivery system, wherein the hologram imparts energy to dissociate the gas precursors causing dissociated gas precursors to deposit in the plane in a pattern corresponding to the hologram as described in column 4, lines 55-68 and column 5, lines 1-34.

However, in regard to claim 7, Deutsch et al does not teach an outlet to exhaust effluent from the processing chamber.

In regard to claim 7, Marcus teaches (see Fig. 1) an outlet (25) to exhaust effluent from the processing chamber.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the exhaust outlet as taught by Marcus in the apparatus of Deutsch et al in order to achieve better control of the deposition process in the chamber thus forming a more precise three dimensional structure.

5. Claims 9, 12 and 18-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Deutsch et al US 4,340,617 in view of Maxwell et al US 5,786,023.

In regard to claim 9, Deutsch et al teaches (see Figure 1) a method for forming a three-dimensional solid structure, the method comprising establishing a process environment (14) and imaging a first hologram within the process environment as

described in column 11, lines 31-40 wherein the hologram imparts energy to the gas precursors, causing the gas precursors to dissociate wherein dissociated solids from the gas precursors form a first solid layer corresponding to the hologram as described in column 4, lines 55-68 and column 5, lines 1-34; and imaging a subsequent hologram within the process environment, wherein the subsequent hologram energy to the gas precursors, causing the gas precursors to dissociate, wherein dissociated solids from the gas precursors form a subsequent solid layer corresponding to the subsequent hologram, wherein the subsequent solid layer is joined to the first solid layer as described in column 10, lines 50-68 and column 11, lines 1-42.

However, in regard to claims 9, 12 and 20, while Deutsch et al teaches the invention as set forth above, it does not teach a process environment having a controllable pressure, temperature and atmospheric composition.

In regard to claims 9, 12 and 20, Maxwell et al teaches (see Figure 1) a process environment having a controllable pressure, temperature and atmospheric composition as described in column 5, lines 54-67, column 6, lines 1-67 and column 7, lines 1-42.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the process environment of Maxwell et al for the method for forming a three-dimensional structure as taught by Deutsch et al in order to change deposit composition so that differing materials may be deposited as needed to tailor a three-dimensional structure's function.

Regarding claim 18, Deutsch et al teaches that the energy to dissociate gas precursors corresponds to a wavelength of electromagnetic energy used to project the first hologram and subsequent hologram as described in column 5, lines 5-24.

Regarding claim 19, Deutsch et al discloses that the energy to dissociate gas precursors corresponds to absorption bands of the gas precursors as described in column 5, lines 5-10.

Regarding claim 21, Deutsch et al discloses wherein an intensity of the at least one hologram is manipulated to manipulate a deposition rate of the dissociated gas precursors as described in column 5, lines 21-29.

Regarding claim 22, Deutsch et al discloses that the gaseous organometallic compounds allow metal to be deposited in the pattern corresponding to the at least one hologram as described in column 5, lines 5-20.

Regarding claim 23, Deutsch et al discloses (see Figure 1) that the at least one hologram is projected onto a stage (16) within the processing chamber.

Regarding claim 24, Deutsch et al discloses (see Fig. 3) that the stage is thermally biased as described in column 10, lines 50-54.

6. Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Deutsch et al US 4,340,617 in view of Marcus US 5,017,317 and further in view of Amako et al US 5,497,254.

Regarding claim 8, Deutsch et al in view of Marcus teaches the invention as set forth above but does not teach a laser light to generate a coherent collimated

electromagnetic energy and a computer driven phase plate placed in the path of the coherent collimated electromagnetic energy to the hologram.

Regarding claim 8, Amako et al teaches (see Fig. 24) a laser light (2412) to generate a coherent collimated electromagnetic energy and a computer driven phase plate (2404) placed in the path of the coherent collimated electromagnetic energy to the hologram as described in column 16, lines 9-42.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the collimated electromagnetic energy and computer driven phase plate of Amako et al in the apparatus of Deutsch et al in view of Marcus in order to provide a programmable modulation optical device offering increased flexibility and control for producing three-dimensional structures of increasing complexity and variety.

7. Claim 17 is rejected under 35 U.S.C. 103(a) as being unpatentable over Deutsch et al US 4,340,617 in view of Amako et al US 5,497,254.

Regarding claim 17, Deutsch et al teaches the invention as set forth above but does not teach that the holographic projector further comprises a computer driven phase plate illuminated by a laser source to generate the at least one hologram.

Regarding claim 17, Amako et al teaches (see Fig. 24) that the holographic projector further comprises a computer driven phase plate (2404) illuminated by a laser source (2412) to generate the at least one hologram as described in column 16, lines 9-42.



It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the computer driven phase plate of Amako et al in the apparatus of Deutsch et al in order to provide a programmable modulation optical device offering increased flexibility and control for producing three-dimensional structures of increasing complexity and variety.

8. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Deutsch et al US 4,340,617 in view of Maxwell et al US 5,786,023 and further in view of Amako et al US 5,497,254.

Regarding claim 25, Deutsch et al in view of Maxwell et al teaches the invention as set forth above but does not teach that the holographic projector further comprises a computer driven phase plate illuminated by a laser source to generate the at least one hologram.

Regarding claim 25, Amako et al teaches (see Fig. 24) that the holographic projector further comprises a computer driven phase plate (2404) illuminated by a laser source (2412) to generate the at least one hologram as described in column 16, lines 9-42.

It would have been obvious to one having ordinary skill in the art at the time the invention was made to utilize the computer driven phase plate of Amako et al in the apparatus of Deutsch et al in view of Maxwell et al in order to provide a programmable modulation optical device offering increased flexibility and control for producing three-dimensional structures of increasing complexity and variety.

***Response to Arguments***

9. Applicant's arguments with respect to claims 1, 3 and 7-25 have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Alessandro V. Amari whose telephone number is (571) 272-2306. The examiner can normally be reached on Monday-Friday 8:00 AM to 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Drew Dunn can be reached on (571) 272-2312. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ava:ml  
28 November 2005

  
MARK A. ROBINSON  
PRIMARY EXAMINER